

CONDENSED MINUTES

MEETING OF GEOTHERMAL ENVIRONMENTAL ADVISORY PANEL

El Centro, California

August 9, 1978

Meeting called to order by the Chairman, 1:45pm

Members of the Panel present in addition to the Chairman:

Robert D. Conover, Solicitors Office, Department of Interior
Philip L. Cranford, Department of Labor, San Francisco
Willard M. Spaulding, U.S. Fish & Wildlife Service, Washington, D.C.
Lew Porteous, EPA Region IX, San Francisco

In addition, informal representatives from BLM offices in Sacramento, Riverside, and El Centro were present, as well as a representative from the Fish & Wildlife Service in Laguna Niguel, California. The total list of attendees is attached.

INTRODUCTION

Following brief introductory remarks noting the Panels functions and the purposes of the meeting, the chairman requested that the first agenda item be that of the Magma Baseline Data Plan which had been referred to the Panel by mail. Written comments had been received from Geological Survey (Feth) and orally from U.S. Fish & Wildlife Service. Both agreed that the portions of the LLL quarterly report on the Imperial Valley Environmental Project were inadequate to satisfy the needs of Baseline data related to East Mesa. Magma was asked to indicate its intentions in this regard. Mr. Hendricks replied that additional data will be prepared in connection with final summaries of the IVEP project and that additional site-specific data have been acquired at East Mesa. It was agreed therefore that this item would be tabled pending receipt of these additional data from Magma Power. In the meantime the Panel urges Magma and the Geothermal Supervisor's Office to begin close coordination in order to assure that the requirements for Baseline Data acquisition can be completed with minimum slippage possible.

QUESTION: (Porteous) What fill-in has Republic done to complete these exact specific data on their leases at East Mesa?

ANSWER: (Carey) Site-specific data on subsidence, noise, and some other components have been acquired.

AGENDA ITEM 2

The chairman called the Panel's attention to an upcoming symposium in San Diego and in the field at Cerro Prieto, Mexico, dates are September 20 - 22, data are available from his office upon request. Second, a supplemental report dealing with the rare plant species Streptanthus at the Geysers, has been prepared by James Neilsen; copies will be sent to the endangered species office of U.S. Fish & Wildlife Service and circulated to the Panel. Third item, Mr. Spaulding noted the addition of a representative from U.S. Fish & Wildlife Service to the Area Geothermal Supervisor's Office of U.S.G.S. The Panel will welcome Mr. Forrester's presence and will look forward to working with him on that staff. Fourth item, the discussion of Republic Geothermal 10MW Plant at East Mesa. This was presented by Dwight Carey and members of his staff (Campbell & Walker). The data presented were largely supplemental to those which had been presented earlier at the meeting of the Imperial County Planning Commission at which members of the Panel were present. These data are largely contained within the Plan of Utilization already in the hands of the Panel and will not be repeated here. Questions from the Panel and members of the audience followed:

QUESTION: Regarding subsidence of the land surface if the fluids are utilized and evaporated rather than entirely reinjected.

ANSWER: (Carey) They do not expect any subsidence from the activities related to the 10MW Plant. When the 48 MW Plant is operational they do not expect to see subsidence for a few years but anticipate that it may appear later on.

QUESTION: (Haskins) Regarding the growth faults indicated in the geologic cross sections through the reservoir.

ANSWER: (Campbell) Growth faults do not penetrate to the surface nor do they penetrate with their full displacement to the aquiclude at a depth of 2000 to 3000 feet.

QUESTION: (Conover) What will be the use or disposal of the power produced by this plant?

ANSWER: (Carey) They will use much of it for internal operations and testing but the remainder, which they estimate to be about 6MW, will go to San Diego Gas and Electric in all probability.

COMMENT: (Fisher) A note of clarification about the relation between gross and net power output of the array of plants under discussion: The 48 MW new power production from the ultimate plant will consist of an additional of the two plants first with a gross output of 10 MW the second with a gross output of 44 MW making a total of 54. But, it is expected that approximately 6 MW will be used for internal operation and pumping resulting a net power output of 48 MW. It was noted (Carey) that the plant efficiency of the full scale 48 MW plant will be appre-

ably greater than that of the original 10 MW plant because the latter serve as a second stage utilizing in part waste heat from the first stage and increasing the overall efficiency.

QUESTION: (Robinson) On the composition of clays encountered at depth.

ANSWER: (Campbell) Montmorillonite is present at shallow depth, other materials at greater depth. A brief discussion of the possible significance of these compositions to subsidence followed.

QUESTION: (Porteous) What is the probability of accidental fluid release and what are the plans for limiting outflow for example, by diking or other means?

ANSWER: (Carey) The plans contain several provisions for automatic shutdown of equipment in case of failure. As a consequence the total volume of fluid above ground at any one time is actually relatively small.

QUESTION: (Spaulding) Concerning the disposal of boron-bearing liquids those limited to four parts per million (boron).

ANSWER: (Carey) The actual expected value for boron in these fluids is not expected to exceed 2.5 parts per million. Note also that a research contract to University of California will include testing such fluids in relation to the sensitivity of both crops and native vegetation. They also intended to test the possibility of using geothermal fluids to aid the revegetation process.

QUESTION: (Spaulding) Are these plans available?

ANSWER: (Carey) These will be discussed in the supplement to the Plan of Utilization. The University contract will also attempt to establish the tolerance level of existing vegetation to the geothermal components.

QUESTION: (Spaulding) What was the source of the proposed four parts per million limit of boron?

ANSWER: (Durham) I can't explain at this point. Since I did not provide the original information I will have to go back to the original source then get back to you later. It may well be that a one to two parts per million may be more appropriate.

COMMENT: (F. Turner) Requested the Panel's reaction to the proposed U.S. Bureau of Reclamation controlled-release experiment.

ANSWER: The Panel responded some months ago and we agreed that much more carefully controlled small scale studies appeared more appropriate in the light of their attempts to minimize the damage of exactly the kind that was proposed in this experiment. Similar reactions were reported by Stone of the Conservation Division, USGS, and from Imperial County. In response Dr. Turner indicated that he still was uncertain that the

total response of the ecosystem could be adequately predicted from these kinds of small field tests.

FURTHER COMMENT: (Stone) Suggested that if an accident happened then monitoring of the results would provide the kind of data Professor Turner is interested in without engaging in this kind of disaster on purpose.

QUESTION: (Spaulding) Why is Republic's entire leasehold posted to hunting and shooting?

Considerable discussion ensued as to the extent to which restriction of hunting and shooting activities (it now is dove season) was: a) desirable, b) legitimate, c) could be totally prevented. This involved a Round Table of exchange between U.S. Fish & Wildlife Service and BLM, Republic Geothermal and others. It was finally informally agreed that the interest of safety of both personnel and installed equipment require limitation of shooting within reasonable distances of plant and facilities. Informally it seems like a distance of a half mile is a reasonable distance for these purposes. The ability of plant facilities to withstand high-powered rifle fire and related vandalism is an obvious concern.

Coffee break 3:30pm

Meeting resumed approximately 3:45pm. The Panel at this point began a discussion of specific environmental components as related to the Plan of Operation and Environmental Analysis related to it prepared by USGS, Conservation Division. Comments and questions are compartmentalized related to the following environmental perimeters:

WATER QUALITY

QUESTION: (Spaulding) Fish & Wildlife wished to be assured that drilling muds will not contain deleterious components such as heavy metals and that there are no exotic additives.

ANSWER: (Carey) No additives of this sort are used.

QUESTION: (Spaulding) Are analyses available to document this?

ANSWER: (Carey) Analyses of drilling mud themselves are not available. But inasmuch as no additives are used the only sources of exotic components are the hydrothermal fluids themselves. Analyses of fluid from three of Republic's wells are given in the PoO, page i-14, and these tables were projected on the screen for immediate discussion. The principle deleterious components in these records are arsenic averaging about 1/10 of a part per million and boron ranging from 1.5 - 3 parts per million. It is noted that dissolved solids in the thermal fluids range from 1727 to 1860 compared with 1600 in Republic shallow water well. It was noted that previous samples from these wells had been subjected to even more complete chemical analyses.

QUESTION: (Haskins) Regarding the possible effects pumping shallow

water wells to provide water for the initial start up for example, to fill the condenser systems?

ANSWER: (Carey) This is believed to be insignificant as the amounts of water involved are not large.

QUESTION: (Spaulding) Suggesting again that it is desirable to check the boron sensitivity of local vegetation.

QUESTION: (Durham) Regarding the amount of water that Republic visualized it will use for dust control over some specific period.

ANSWER: (Nicholas) Republic estimates that they will use approximately two acre feet per year for the existing roadways.

QUESTION: (Crittenden) Would it be cheaper and more affective to pave roads rather than provide water to keep them dust free over a long period of time?

ANSWER: (Carey) The principle reason for proposing to use water is a means of disposing of materials that would otherwise be hard to dispose of.

QUESTION: (Crittenden) Regarding the disposal of waste materials such as scale, etc.

ANSWER: (Carey) They plan to use a scale inhibitor (Phosphonate) which they believe will be entirely effective in eliminating scale. Small amounts of other scale that may be present will be conveyed to a appropriate dump. These scales are expected to consist primarily of calcium carbonate and silica.

AIR QUALITY

The Panel has nothing to add at least to the data presented in the PoO and the Environmental Analysis and they agreed that the impact on air quality should be negligible.

NOISE

The Panel had no comments or additions related to noise and agreed that the impact of the plant in operation will be negligible on this score.

EROSION AND RESTORATION

QUESTION: (Spaulding) Urges revegetation of temporarily disturbed areas without waiting for long term natural recovery to take place.

ANSWER: (Carey) Republic does not really know how to revegetate these areas on a permanent basis and this is one of the reasons for the research grant to University of California to investigate possible ways to accomplish this including the proposal to try the use of geothermal

fluids themselves to support the revegetation process. Spaulding notes also that both U.S. Fish & Wildlife and BLM have undertaken experiments to determine what are the most appropriate plant species and under what conditions they can be most readily used for revegetation in arid areas and urges that Republic consult with these agencies to aid in this process.

BIOTA

Comments from U.S. Fish & Wildlife Service, and the California Department of Fish and Game are attached. Their primary concerns relate to the possible existence of certain species of plants and animals which have been proposed for rare and endangered status. These include the Kit Fox. In response to a question from the chairman, BLM, (Fanzreb) simple walking of access roads and proposed route indicates a number of Kit Fox dens in close proximity to these well traveled thoroughfares and suggests that collaboration to minimize disturbance of those den sites could be readily accomplished. The important period of avoidance is during the spring when dens are occupied by young too immature to move. Second, horned lizard - a report by Professor Frederick Turner of UCLA is attached. Additional data regarding other plant species will be forthcoming.

SEISMICITY AND SUBSIDENCE

Please see draft recommendations.

SOCIO-ECONOMIC EFFECTS

A brief discussion was carried out in response to a question from Cranford regarding the nature and size of the workforce required. It appeared that a maximum of about 200 people would be required during the late stages of construction of the 10 MW Plant and early stages of the 48 MW Plant if all is on schedule. During stable operation of the larger plant it was estimated that not more than a total of 25 people, including field personnel, would be required. It was noted that an abundance of local unskilled labor is available and that the technical workforce required for plant operation was very limited in this area. Republic will try to assist in developing training programs so that personnel with this experience can be developed locally rather than brought in from the outside. The Department of Labor expressed concern and interest regarding these training programs in view of the perennial unemployment in this agricultural area.

Recreation, archaeology and antiquities; and aesthetics and visual impact did not receive additional comment from the Panel. It appears adequately covered in the existing PoO and Environmental Analysis.

CONCURRENCE WITH FINDING OF A NON MAJOR FEDERAL ACTION

In view of the information in both written form and during oral discussion at the meeting itself, the members of the Panel present were polled

asking whether they concur with the finding of the Area Geothermal Supervisor that the present proposal does not constitute a major federal action in the sense of NEPA, subsection 2, (c). Members of the Panel present were unanimous in this concurrence. Those members who were not present are polled by means of this draft and are asked to respond if they disagree. In the absence of emendations to these draft minutes or negative response to the draft summary and recommendation by 25 August 1978 it will be assumed that absent members also concur. Positive oral (telephone) or written response is of course preferable and is invited.

Respectfully submitted,

Max D. Citterden, Jr.
by J.H.F.